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PERFORMANCE ANALYSIS ON WASTE GLASS POWDER AND FLY ASH AS PARTIAL REPLACEMENT FOR CEMENT IN CONCRETE

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Abstract - *Glass is used in many forms in day-to-day life, it has limited life span and after use it is either stock piled or recycled for further products. As glass is non biodegradable, landfills do not provide an environment friendly solution for disposal. The fly ash contains more silica compared to cement. Now a days many industries produce large amount of fly ash and it is sold at a cheaper rate in the market, With the increase in building material cost, there is a need of alternate solution so I prefer utilize waste glasses and fly ash In our study, waste glass powder and fly ash were partially replaced for cement in concrete and compared it with conventional concrete.*

Key Words: **flyash, silica, waste glass powder, eco-friendly, landfill, sustainability**

1.INTRODUCTION

In our project fly ash and glass powder were partially replaced for cement, so the utilization of cement is less thereby reducing the cost of construction, by reducing the cement usage by replacing glass powder and fly ash, the pollution generated by cement manufacturing industry can be reduced. The formation of green house gases will be reduced, By using Class F fly ash in concrete, the alkali silica reaction generated by waste glass powder can be prevented. The glass powder and fly ash which were considered as wastes can be effectively utilized in the concrete without polluting the environment.

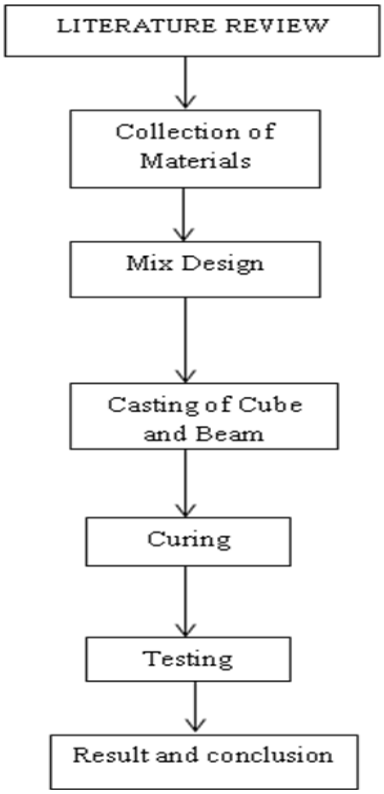
1.1 Objective

- The aim of our thesis is to use glass powder as a partial replacement for cement to assess the pozzolonic activity of fine glass powder and fly ash in concrete and compare its performance with that of the conventional concrete.
- Glass powder and fly ash is replaced partially for cement in two different proportions
- Glass powder alone is replaced is three different percentage 10%, 20%, 30%, 40% for M20, M25,M30 Grade.
- To increase the cementitious properties in the concrete mixture, the proportion of glass powder and fly ash is added in the following proportions
- Glass powder 5% and fly ash 5% M25, M30 Grade.
- Glass powder 10% and fly ash 10% M25, M30 Grade.
- Glass powder 15% and fly ash 15%., M25, M30 Grade.
- Glass powder 20% and fly ash 20%. M25, M30 Grade.
- The partially replaced waste glass material and F class fly ash size is less than 80µm

1.2 Work Plan

- Collection of Literature: First Week of January.
- Collection of Materials: Second Week of January.
- Testing Materials: Third Week of January.
- Mix Design: End of January.
- Casting of Cube, Cylinder, and Beam: Second Week of February.
- Testing the Specimens: test conducted on 7 days, 14 days,& 28 days, it may completed on Second Week of March.
- Result and discussion: End of March.

2 Methodology



3.Budget

Purchasing Glass Powder, Fly Ash Class F, Coarse aggregate, Fine Aggregate, Cement

Sl.No.	Name of the item to be Purchased	Quantity	Unit Cost	Amount RS
1.	Glass Powder	20 Kgs	46/Kg	920
2.	Fly Ash Class F	20 Kgs	20/Kg	400
3.	Coarse Aggregate	2 Unit	2000/ Unit	4,000
4.	Fine Aggregate	1 Unit	3,200/ Unit	3,200
5.	Cement (Ultra tech 53 Grade)	3 Bags (50 Kgs)	400	1,200
Total				9,720

4. Conclusion

Considering the performance of glass powder partial replacement enhances the sustainability of concrete with reducim the construction cost upto 14 percent. The fly ash with waste glass powder reduces the carbon monoxide gas emissions from increasing cement production. Adding fly ash in the cement mortar also reduces permeability. the fine particles in the fly ash helps to reduce the segregation and bleeding of cement mortars. Properly proportioned concrete containing flyash and waste glass powder should create at a lower cost.

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